

Readme: OMI Level 3 monthly PBL SO₂ maps (OMSO2e)

Maps in this directory show global monthly mean Aura/OMI PBL SO₂ vertical column density (VCD) in Dobson Unit (DU, 1 DU = 2.69×10^{16} molecules/cm²). The monthly mean SO₂ VCD is calculated by averaging all daily level 3 (L3) OMISO2e SO₂ data within each month. The L3 OMISO2e data are a gridded dataset with a spatial resolution of $0.25^\circ \times 0.25^\circ$. They are produced by applying local air mass factor correction to the best cloud-free pixel (minimal optical path, cloud fraction < 0.2) from the level 2 (L2) planetary boundary layer (PBL) SO₂ product (OMISO2) that falls within each grid cell. To access the L3 OMISO2e data, visit the NASA GSFC DISC website at http://disc.sci.gsfc.nasa.gov/Aura/data-holdings/OMI/omso2e_v003.shtml. Documents describing the OMISO2e data can also be found in the above link.

The L2 PBL SO₂ data in the OMISO2 product are presently produced with a new algorithm based on principal component analysis (PCA) of OMI radiances [Li *et al.*, 2013]. The PCA algorithm is sensitive to relatively weak anthropogenic SO₂ emission sources but likely overestimates SO₂ within transient volcanic plumes, due to assumptions (*e.g.*, SO₂ plume height) in retrievals that are optimized for detecting signals in the PBL. As a result, some of maps in this directory may show strong SO₂ signals from large volcanic eruptions (*e.g.*, the Kasatochi eruption in August 2008). The L2 OMISO2 data can be accessed at http://disc.sci.gsfc.nasa.gov/Aura/data-holdings/OMI/omso2_v003.shtml, with documents available at <http://so2.gsfc.nasa.gov/docs.html>.

References

Li, C., J. Joiner, N. A. Krotkov, and P. K. Bhartia (2013), A fast and sensitive new satellite SO₂ retrieval algorithm based on principal component analysis: Application to the ozone monitoring instrument, *Geophys. Res. Lett.*, 40, doi:10.1002/2013GL058134.